cord.[1] Experiments which were then in progress have been extended until still more of the details of spinal shock following anatomical transection of the cord have been duplicated (1) by the method of cerebral anemia described in the paper cited, and elsewhere, and (2) by freezing the spinal cord with a spray of ethyl chloride or by the direct application of liquid air. Freezing the brain as a means of stopping the reflexes was probably first done by Professor D. J. Lingle (unpublished experiment on frog). Practically all of the effects observed after anatomical rupture of the conduction pathways may be observed when either of the other methods is employed, if the time limits be kept the same when comparing the results of the different methods. We called attention in a previous paper to the fact that strychnine spasms might appear immediately after the beginning of cerebral anemia, or at any time during which the reflexes of the skeletal muscles are absent. I have since shown that, in a curarized animal, strychnine does not cause the return of vaso-motor reflexes in "shock" sooner than they would appear under the usual conditions of the experiment.

The evidence for my views, drawn as it is from a laborious study of the phylogenetic development of the function as well as the structure of the central nervous system, can not be presented here. Nor is this the place to develop my hypothesis of the return of the reflexes after interruption of the long pathways, which depends upon facts of the same nature. Both hypotheses will be developed in detail in later papers. It will be sufficient to point out here that, in my opinion, the real problem is to explain the return of the reflexes after injury to the brain or spinal cord, and that a simple solution to both problems lies in the application of the general principles of organic evolution to function as well as to structure.

F. H. PIKE

HULL PHYSIOLOGICAL LABORATORY,
THE UNIVERSITY OF CHICAGO,
November 10, 1908

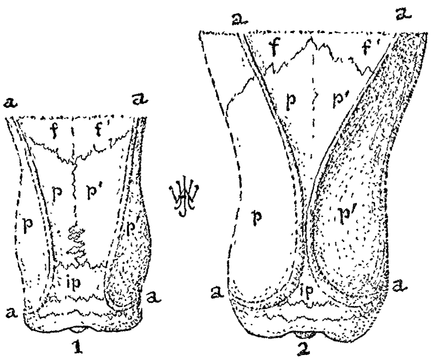
[1] Pike, Guthrie and Stewart, *American Journal of Physiology*, 1908, XXI., p. 359. See, also, Rosenthal and Mendelssohn, *Neurologisches Centralblatt*, 1897, XVI., 978.

A NEW SPECIES OF THE GENUS MOROPUS

SINCE the fall of the year 1904 the Carnegie Museum has carried on extensive excavations in a quarry near the Agate Spring Stock Farm on the Niobrara River in Sioux County, Nebraska. The work has resulted, among other things, in the recovery of an almost perfect skeleton of an adult specimen of *Moropus elatus* Marsh, which will shortly be mounted and exhibited, and upon which the writer intends in the early winter to publish a memoir giving a full account of the osteology of this great mammal. Among the material collected are a number of bones representing the remains of another species of the same genus to which, in honor of my esteemed colleague, Mr. O. A. Peterson, I propose to apply the name *Moropus petersoni*. A more detailed description, accompanied by figures and plates, will be published in the forthcoming *Memoir*. For the present I content myself with the publication of a brief diagnosis wherein are pointed out some of the differences which distinguished this species and permit of its separation from *Moropus elatus* Marsh.

Moropus petersoni, sp. nov.

Adult. Considerably smaller in size than *Moropus elatus*. The dentition, so far as ascertained, does not materially differ from that of the larger species. The top of the cranium is not, however, characterized by a sagittal crest as is the case in *Moropus elatus*. In order to understand the difference between the two species the accompanying somewhat diagrammatic figure, representing the posterior portion of the top of the skull of the two species, is given. It will be seen that the narrow elevated ridges marked *aa* do not converge on the median line in *Moropus petersoni* as they converge upon the skull of *Moropus elatus*. It will further be observed that the interparietal bone *ip* in *Moropus petersoni* is quadrate in form, whereas in *Moropus elatus* it is subtriangular in form. The cervicals in *Moropus petersoni* are less massive; the fore limbs are proportionately slenderer; the scapula is relatively longer and narrower than in *M. elatus*. The lateral transverse process of the fifteenth dorsal is simple at its outer extremity and does not form an oblique plate



Diagrammatic view of upper back part of skulls of (1) *M. petersoni*, (2) *M. elatus*. *aa*, superior ridges; *pp'*, parietals; *ff'*, frontals; *ip*, interparietal.

of bone projecting downward and backward and perforated by a large foramen, as is the case in the corresponding vertebra in *Moropus elatus*. The prezygapophyses of the anterior lumbar vertebræ in *M. petersoni* more closely resemble those of the preceding dorsals and are not as distinctly lumbar in their character as is the case in *Moropus elatus*. The prezygapophyses of the posterior dorsals all look more decidedly upward in *M. petersoni* than they do in *M. elatus,* and their anterior extremities are relatively far more widely separated from the superior margin of the centrum. The general structure of the feet is the same as in *Moropus elatus,* having four toes in the fore foot, the outer toe being obsolescent, and three toes on the hind foot; but the feet are slenderer and the bones not nearly so massive as in the larger species.

The type specimens representing the species are contained in the Carnegie Museum and are in part the series of bones to which have been attached in the Carnegie Museum Catalogue of Vertebrate Fossils the numbers 1703A (cervicals), 1703B (anterior dorsals), 1703C (posterior dorsals and lumbars), 1700 (mounted hind limb and pes), 1701 (a mounted fore limb and manus), 1707 (a partially restored skull).

Associated with the skull as a paratype may be mentioned the upper posterior part of a cranium of a skull designated by the figures H. C. 133, kindly loaned to the writer for study by Mr. Harold Cook. Professor E. H. Barbour in Volume III., Part 2, of the Geological Survey of Nebraska (Fig. 2) has represented a fragment of the posterior part of the skull of an immature specimen of *Moropus petersoni,* without naming it.

W. J. Holland

Carnegie Museum,
November 13, 1908

AN ELECTRICAL RESISTANCE METHOD FOR THE RAPID DETERMINATION OF THE MOISTURE CONTENT OF GRAIN[1]

The shipping and storing qualities of grain are so dependent upon its moisture content that an accurate knowledge of the moisture in grain in storage and transit is highly desirable. This subject has been given special attention by Brown and Duvel,[2] who have described a rapid method of making such moisture determinations. Their method consists in boiling the grain in an oil having a flashing point much above the boiling point of water, condensing the water which distils off, and collecting and measuring it in a suitable graduate. Moisture determinations can, by this method, be made in about one half hour, whereas determinations in the water oven require several days. This method is, however, suitable for laboratory use only, necessitating the collecting of samples before the determinations can be made, and does not appear to be adapted to grain products such as meal and flour. At the request of the Office of Grain Standardization, the writer undertook the development of an electrical resistance method of measuring the moisture content of grain adapted to measurements in the car or elevator as well as in the laboratory, and requiring only two or three minutes for a determination. The measurements so far have been confined to wheat. The results obtained are so promising that a brief preliminary

[1] See Circular 20, Bureau of Plant Industry.

[2] Bulletin 99, Bureau of Plant Industry, U. S. Department of Agriculture, 1907.